

Network Evolution to NGN and Convergence

1.2.1 ITU-T: Activities on NGN



Communications
Commission
of Kenya

*ITU-BDT Regional Seminar on Fixed
Mobile Convergence and Guidelines on
the smooth transition of existing mobile
networks to IMT-2000 for Developing
Countries for Africa Region*

Nairobi, Kenya 9-12 May 2005

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Objective and Outline

- **Objective**
 - Provide an overview of the activities within ITU-T on Next Generation Networks
- **Outline**
 - Historical Perspectives
 - Definition of NGN
 - GII, IMT-2000 and NGN
 - Creation of Focus Group NGN
 - What is a Focus Group?
 - FG NGN Structure and Leadership
 - FG NGN Participation, Deliverables



Historical Perspectives

- **Everyone working on standards is working on “the next generation”**
 - The “current generation” is already specified and deployed
- **ITU-T SG 13 traditionally forward looking:**
 - ISDN
 - Global Information Infrastructure
 - NGN 2004 Project
- **Other SGs have turned vision into reality**
 - SG 11: CCS7, ISDN protocols, Intelligent Networks, ...
 - SSG (now SG 19) separated from SG 11 in recognition of rapidly increasing importance of mobility as a high utility feature for users, global predominance of mobile subscribers, innate deployment efficiencies of wireless

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Definition of NGN

Rec. Y.2001 “General overview of NGN” (Dec 2004):

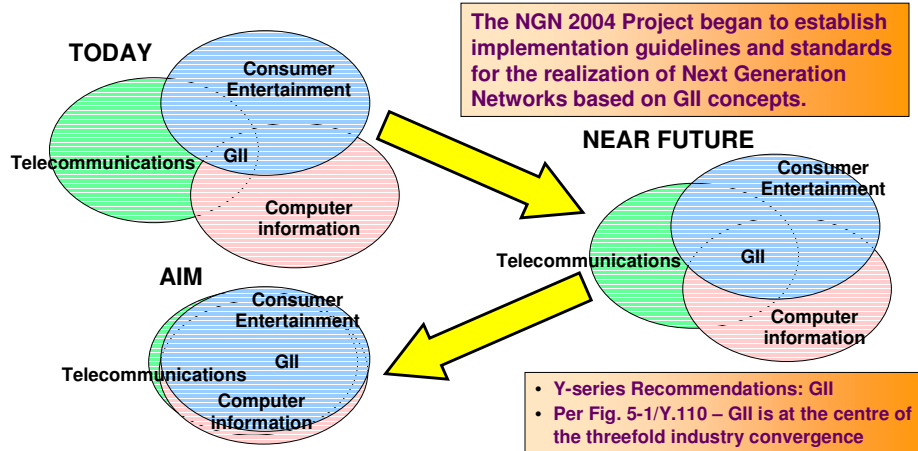
- **An NGN is a packet-based network able to provide Telecommunication services and able to make use of multiple broadband, QoS-enabled transport technologies and in which service-related functions are independent from underlying transport-related technologies. It enables unfettered access for users to networks and to competing service providers and/or services of their choice. It supports generalized mobility which will allow consistent and ubiquitous provision of services to users.**

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Global Information Infrastructure is all about convergence

Internet, Broadcasting, Telephony, ...

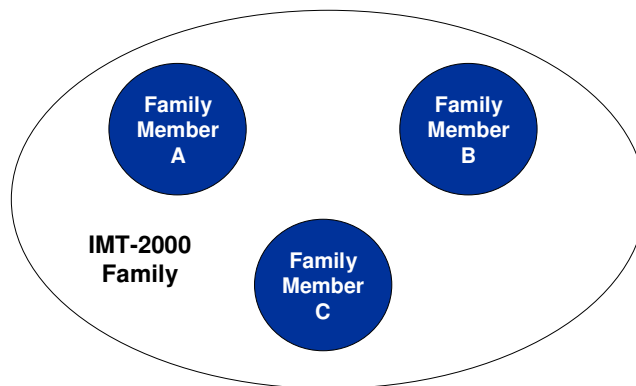


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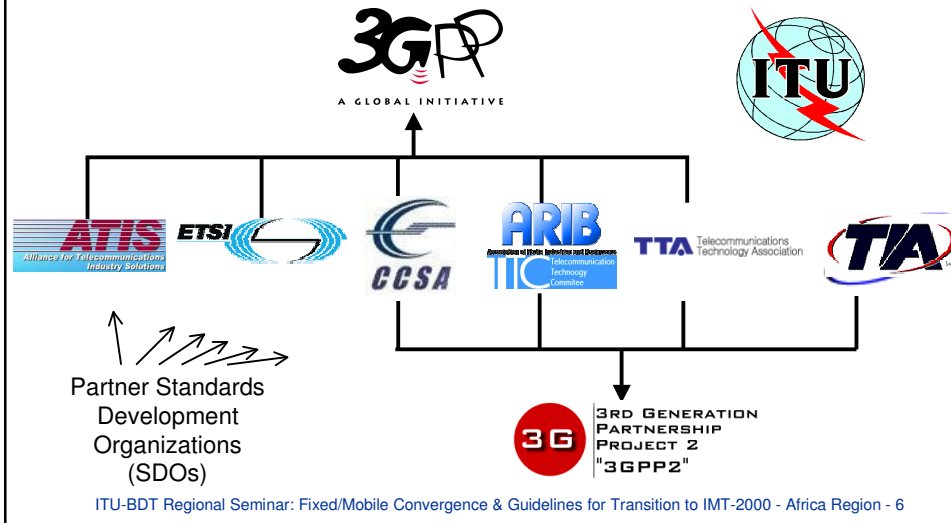
IMT-2000 Family Concept

- ITU-T Rec. Q.1701 (03/99) Figure 2: Framework for IMT-2000 networks

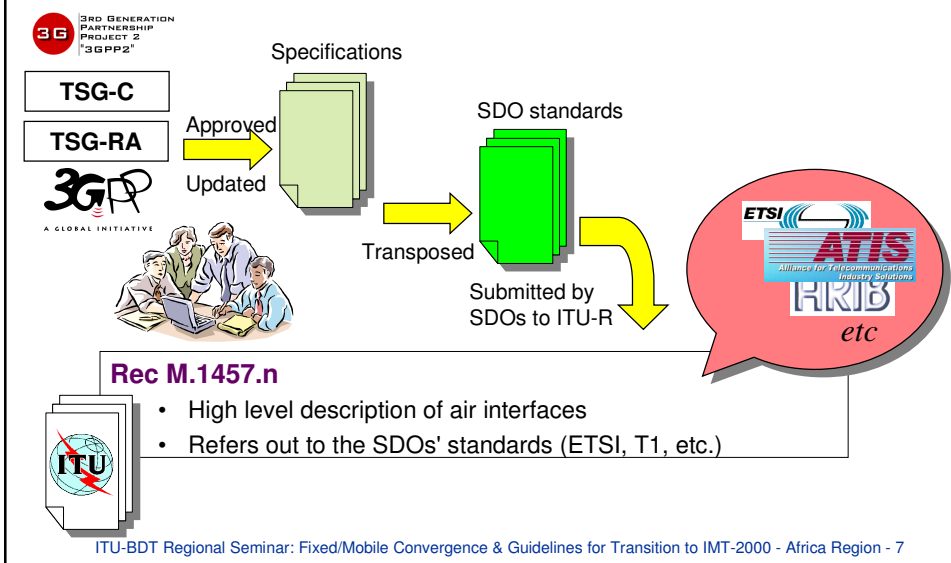


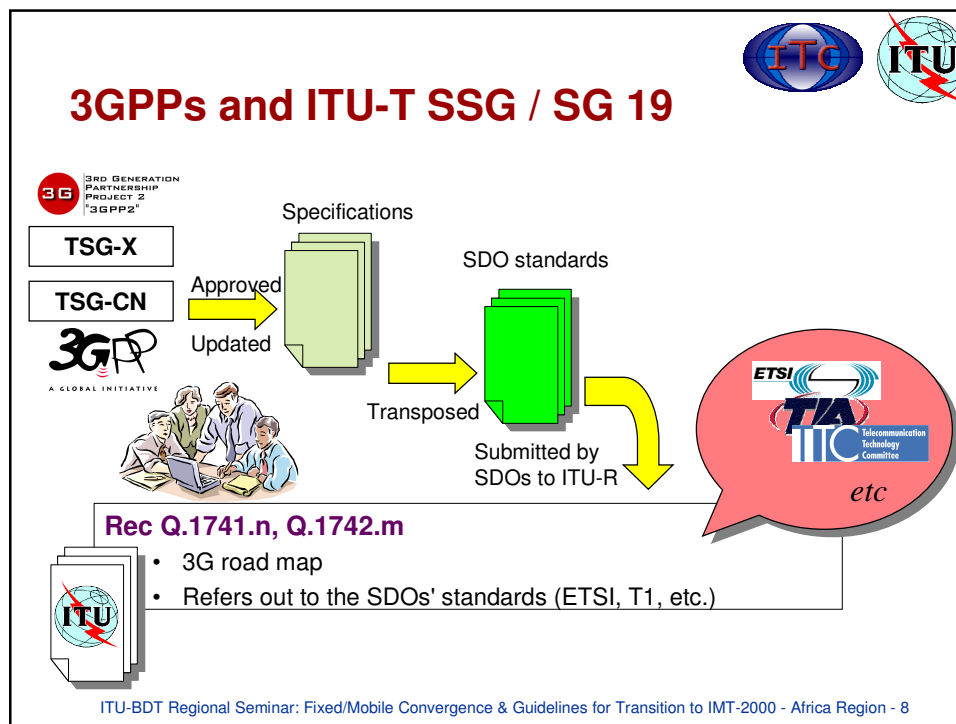
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ITU and the SDO partners of the 3G Partnership Projects



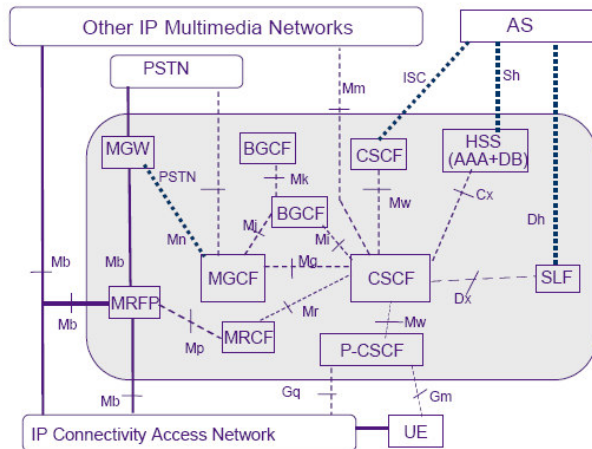
3GPPs and ITU-R WP 8/F





-
- ## 3GPP IMS and 3GPP2 MMD essential alignment
- **IMS: a set of core network FEs to support access to operator provided SIP based services**
 - **Builds on IETF protocols: SIP, SDP, DIAMETER**
 - **Vertical interfaces to transport level provide:**
 - QoS
 - Media gating
 - Correlated Accounting/Charging
 - **Coordinated network interfaces provide:**
 - Improved security, single authorization point for user
 - Enhanced user service experience: single sign-on
 - Common interfaces to Application Servers
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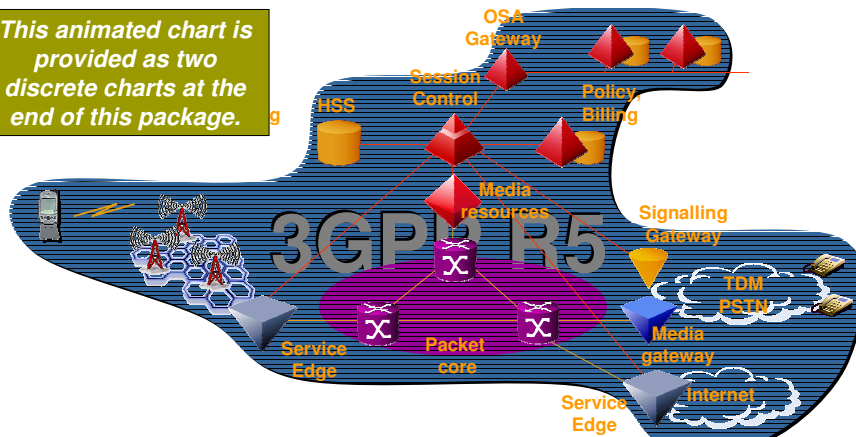
Harmonized IMS Functional Architecture



For a good tutorial on the IMS and how it works, go to <http://www.itu.int/ITU-T/worksem/ngntech/details.html> and download presentation 1-3 given at the NGN Technical Workshop (14-15 Mar 2005, Jeju, Korea)

3GPP R5 network architecture

This animated chart is provided as two discrete charts at the end of this package.

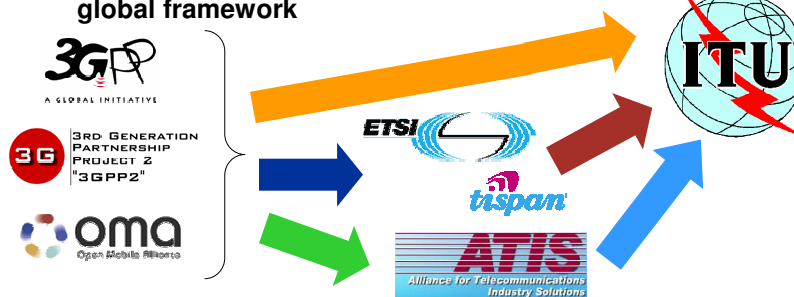


- 3GPP R5 IM Subsystem provides a SIP and H248 framework for the applications and control environment of converged wireless networks
- Applications creation environment permits extending applications to users independently of their means and point of access



NGN Standards

- Many organizations working on NGNs, future generation technologies, ...
 - ITU providing global perspectives for an overall framework
 - ITU leveraging near term detailed and well-focussed technical work of relevant bodies into this consistent global framework



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ITU-T Focus Group on Next Generation Networks

- Launched by ITU TSB Director in May 2004
 - TSB Circular 236, 7 May 2004
<http://www.itu.int/md/meetingdoc.asp?type=sitems&lang=e&parent=T01-TSB-CIR-0236>
- Initial meeting: June 2004
 - Subsequent meetings: Jul, Sep, Nov 2004, Mar, Apr 2005
 - Future meeting plans: Jul, Sep, Nov 2005
- Key topics to be addressed:
 - Functional architecture, nomadcity
 - QoS (including xDSL Access)
 - Security Capabilities (Authentication, ...)
 - Control and Signaling Capabilities
 - Evolution to NGN

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ITU-T Focus Groups: a highly flexible means to progress technical work (1/3)

- **Objective of focus groups**
 - Help advance work of ITU-T parent study group
 - Encourage participation of experts and individuals who may not be members of ITU
- **Establishment**
 - Based on a proposal (incl. terms of reference)
 - A study group has authority to approve formation, become parent SG
 - May be established at or between study group meetings
 - Proposal may be submitted by any member to focus group review committee: parent SG leadership, TSAG Chairman, TSB Director
 - Once agreed, info posted on ITU-T web site and work may proceed
- **Terms of reference**
 - Must include plan of action, expected deliverables, time schedule
 - Relationship to work of parent SG must be indicated
 - Focus Group term and scope may be renewed, extended by parent SG as needed

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ITU-T Focus Groups: a highly flexible means to progress technical work (2/3)

- **Leadership**
 - Chairman, vice-chairman initially appointed by parent SG
 - Further appointments made within focus group as needed
- **Participation**
 - Open to any individual from a country which is a member of ITU
 - Should not be used as an alternative to ITU membership
 - List of participants to be maintained for reference purposes
- **Financing**
 - Determines own method of financing
 - Does not draw on ITU-T resources except use of TIES
 - Non-ITU members pay a fee determined by TSB for use of TIES
 - Financing of meetings: volunteer hosting similar to Rapporteur groups, or per financial arrangements determined by the Focus Group
- **Administrative support**
 - May establish own method of providing, financing admin support
 - If TSB admin services used, costs to be covered by Focus Group

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ITU-T Focus Groups: a highly flexible means to progress technical work (3/3)

- **Meeting logistics**
 - Frequency, location, duration decided by Focus Group
 - Use of EDH encouraged
- **Patent policy**
 - TSB patent policy to be used (RAND)
- **Deliverables**
 - May be in form of technical specifications, reports, etc.
 - Expected to form input to the work of the parent SG
 - Parent SG may convert to ITU-T Recommendations (AAP process)
 - May establish own rules of approval: expected generally by consensus
- **Progress reports**
 - To be provided to each parent SG meeting; to include:
 - updated work plan and status, schedule of planned meetings
 - summary of contributions considered; list of attendees
- **Working guidelines**
 - May develop additional internal working guidelines as required
- **Reference: ITU-T Rec. A.7 Focus groups: Working methods and procedures**

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FG NGN Structure

<u>WG</u>	<u>Area of work</u>
• WG 1	Service Requirements
• WG 2	Functional Architecture and Mobility
• WG 3	Quality of Service
• WG 4	Control & Signalling
• WG 5	Security
• WG 6	Evolution
• WG 7	Future Packet-based Bearer Network

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FG NGN Leadership (1/2)

Chairman:	Chae-Sub Lee	ETRI, Korea
Vice-Ch:	Dick Knight	BT, UK
Vice-Ch:	Neil Seitz	US DoC/NTIA, USA
• WG 1	Marco Carugi Brent Hirschman	Nortel, France Sprint, USA
• WG 2	Keith Knightson Tom Towle Naotaka Morita	Canada Lucent, USA NTT, Japan
• WG 3	Hui-Lan Lu Keith Mainwaring Hyungsoo Kim	Bell Labs, USA Cisco, USA Korea Telecom



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FG NGN Leadership (2/2)

• WG 4	Rainer Muench Cagatay Buyukkoc Wei Feng	Alcatel, Germany ZTE, USA Huawei, China
• WG 5	Igor Faynberg	Lucent, USA
• WG 6	Ghassem Koleyni Dongyang Fan	Nortel, Canada SCNB Tel. Stds., China
• WG 7	Jiang Lintao David Meyer Keith Dickerson	MII, China Cisco, USA BT, UK



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Participation, Input Statistics

<u>Meeting</u>	<u>Inputs</u>	<u>Participants</u>
Jun 04	39	99
Jul 04	66	66
Sep 04	141	121
Nov 04	125	123
Mar 05	168	144
Apr 05	131	144

- NGN work is clearly a “going concern” and high interest area for standards development: attracting significant volume of input material, significant participation

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FG NGN Work Plan - Deliverables

WG 1 Service Requirements

WG	Deliverable Title	Current Draft	Target Date	Release	Status	Target SG*
1	NGN Release 1 Scope	FGNGN-OD-00097	2Q05	1	S	13
1	NGN Release 1 requirements	FGNGN-OD-00098	3Q05	1	D	13
1	NGN release-independent requirements	(none)	4Q05	RI	P	13
1	NGN general services and capabilities (release independent)	(none)	4Q05	RI	P	13

Plan as of 22 March 2005

Release

- TBD To Be Determined
- RI Release Independent
- * Proposed

Status:

- P Planned: document not yet available
- D Draft: draft available, under review
- S Stable: reviewed, some additional review needed for full consensus; new text not anticipated
- A Approved

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FG NGN Work Plan - Deliverables

WG 2 Functional Architecture and Mobility

WG	Deliverable Title	Current Draft	Target Date	Release	Status	Target SG*
2	Requirements & Architecture for NGN (FRA)	FGNGN-OD-00093	2Q05	1	D	13
2	Functional Requirements for NGN Mobility (FRMOB)	FGNGN-OD-00094	2Q05	1	D	13 / 19
2	Functional Requirement for Soft Router		TBD	2	D	13
2	Customer Manageable IP Network	FGNGN-OD-00096	2Q05	2	D	13
2	IMS for Next Generation Networks (IFN)	FGNGN-OD-00095	2Q05	1	D	13
2	Digital Multimedia Broadcast	(none)	TBD	2	P	13
2	Converged Services Fabric	(none)	TBD	2	P	13

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FG NGN Work Plan - Deliverables

WG 3 Quality of Service

WG	Deliverable Title	Current Draft	Target Date	Release	Status	Target SG*
3	A QoS control architecture for Ethernet-based IP access networks (TR-123.qos)	FGNGN-OD-00106	Mar 05	1	A	13
3	Multi Service Provider NNI for IP QoS (TR-msnniqos)	FGNGN-OD-00107	Jul 05	1	D	13
3	General aspects of QoS and network performance in NGN (TR-NGN.QoS)	FGNGN-OD-00108	Jul 05	RI	D	13 / 12
3	Network performance of non-homogeneous networks in NGN (TR-NGN.NHNperf.)	FGNGN-OD-00109	Jul 05	RI	D	13 / 12
3	Requirements and framework for end-to-end QoS in NGN (TR-e2eqos.1)	FGNGN-OD-00110	Sep 05	1	D	13
3	A QoS architecture for Ethernet networks (TR-enet)	FGNGN-OD-00111	Sep 05	1	D	13
3	Resource and admission control sub-system (TR-racs)	FGNGN-OD-00112	July 05	1	D	13
3	A QoS Framework for IP-based access networks (TR-ipagos)	FGNGN-OD-00113	Sep 05	1	D	13
3	Performance measurement and management for NGN (TR-pmm)	FGNGN-OD-00114	Jul 05	1	D	12



FG NGN Work Plan - Deliverables

WG 4 Control & Signalling

WG 5 Security

WG 6 Evolution

WG	Deliverable Title	Current Draft	Target Date	Release	Status	Target SG*
4	Signalling requirements for IP QoS TRQ_IP QoS.SIG.CS1	Q Series Supplement 51	Dec. 04	1	A	11
5	Guidelines for NGN Security	FGNGN-OD-00083	2Q05	TBD	D	17
5	Security Requirements for R1	FGNGN-OD-00082	1Q05	1	S	17
6	Evolution of Networks to NGN	FGNGN-OD-00085	3Q05	1	D	13
6	PSTN/ISDN evolution to NGN	FGNGN-OD-00086	3Q05	1	D	13
6	PSTN/ISDN emulation and simulation	FGNGN-OD-00087	3Q05	1	D	13

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FG NGN Work Plan - Deliverables

WG 7 Future Packet-based Bearer Network

WG	Deliverable Title	Current Draft	Target Date	Release	Status	Target SG*
7	Problem Statement	FGNGN-OD-00028	4Q04	2	S	13
7	Requirements	FGNGN-OD-00088	3Q05	2	D	13
7	High Level Architecture	FGNGN-OD-00089	4Q05	2	D	13
7	Candidate Technologies	(none)	3Q05	2	P	13

Release

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- * Proposed

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Coordination needed: multiple Study Groups involved

Principle SGs:

- 2 Operational aspects of service provision, networks and performance
- 4 Telecommunication management
- 11 Signalling requirements and protocols
- 13 Next Generation Networks**
- 19 Mobile telecommunication networks

Other SGs:

- 12 Performance and quality of service
- 16 Multimedia terminals, systems and applications

All SGs have some degree of involvement

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Coordination effected: Joint Coordination Activity (JCA)

- **NGN is a major activity**
 - SG 13 is designated the Lead Study Group on NGN
- **Many other SGs involved**
 - Ref. the list of deliverables
- **JCA created to coordinate activities across the involved SGs**
 - initial meeting: Dec 2004
 - second meeting: May 2005
- **FG NGN provides regular updates on its work to ensure all involved SGs are fully informed**
 - enables SGs to review provide input outside FG NGN cycle
 - avoids “surprises” when going to SGs for approvals

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ITU-T / IETF NGN Workshop 1-2 May 2005

- ITU-T aims to engage all interested parties for development of worldwide standards for NGN
 - 3GPP IMS is at the heart of NGN
 - IMS uses IETF protocols
 - ∴ essential that ITU-T, IETF and 3GPP work together effectively to deliver needed specifications and standards
- Overall workshop objective:
 - Explore specific NGN issues that impact both the ITU-T and the IETF to better understand the work underway in the two organizations and to identify areas where actions could be taken ... to further coordinate their work
- Further details: <http://www.itu.int/ITU-T/worksem/ngn/200505/index.html>

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Some key work areas for realizing the NGN converged network vision

SERVICE ENABLING ENVIRONMENT

- Voice quality & functionality
- Presence technology
- Application integration
- Server & database integrity
- Security
- Multi-service networking
- Carrier grade scaling, performance, reliability
- Mobility services

COMMON OPTICAL & PACKET FOUNDATION

- Multi-service access
- High speed high density
- Lambda management
- Photonic switching

NETWORKING ATTRIBUTES

- System availability
- Hardware availability
- Real-time software
- Scalability
- Interoperability
- Distributed software
- Management integration
- Solution integration

Much interesting and challenging work still to be done!

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Thank you!

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Selected Acronyms

3GPP	Third Generation Partnership Project	MRFC	Media Resource Function Controller
3GPP2	Third Generation Partnership Project 2	MRFP	Media Resource Function Processor
AAA	Authentication, Authorization and Accounting	NGN	Next Generation Network
AS	Application Server	P-CSCF	Proxy CSCF
BGCF	Breakout Gateway Control Function	QoS	Quality of Service
CCS7	Common Channel Signalling System No. 7	R5	Release 5
CSCF	Call Session Control Function	RAND	Reasonable And Non-Discriminatory
DSL	Digital Subscriber Line	RTP	Real Time Protocol
FG	Focus Group	S-CSCF	Serving CSCF
GII	Global Information Infrastructure	SDO	Standards Development Organization
HSS	Home Subscriber Server	SDP	Session Description Protocol
I-CSCF	Interrogating CSCF	SG	Study Group
IMS	IP Multimedia Subsystem	SIP	Session Initiation Protocol
IMT-2000	International Mobile Telecommunications 2000	SSG	Special Study Group
IP	Internet Protocol	TIES	Telecom Information Exchange Services
ISDN	Integrated Services Digital Networks	TSAG	Telecommunication Standardization Advisory Group
JCA	Joint Coordination Activity	TSB	Telecommunication Standardization Bureau
MGCF	Media Gateway Control Function	TSG	Technical Specification Group
MGW	Media Gateway		

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